What is claimed is:

1. A multi-channel communication system for data communication comprising:

a first station;

a plurality of second stations; and

medium access control means for controlling operation of said data communication via one or more data links and control links between said first station and said second stations, said operation comprising:

transmitting, from said second stations, one or more request packets to said first station via said one or more control links, said one or more request packets including a preamble code and a padding code,

transmitting, from said first station, one or more code assignment commands to one or more of said second stations via said one or more control links, and

transmitting, based on said one or more code assignment commands, one or more data packets from said one or more of said second stations to said first station via said one or more data links.

2. The system of claim 1, wherein said communication system is a wireless system, said first station is a base station and said second stations are mobile stations.

3. The system of claim 1, wherein said padding code comprises a dummy data code and an error detection code for collision detection by said first station.

4. The system of claim 1, wherein said padding code is selected based on a random selection of said preamble code.

5. The system of claim 1, wherein a predetermined number of said preamble codes transmitted by said second stations is processed by said first station.

6. The system of claim 1, wherein said one of said one of more second stations spreads and modulates said data packet by a data scrambling code selected from among scrambling codes s_k where k=0...n, and said data scrambling code is randomly selected as follows:

$$k = j \times m + r$$

where j represents a sequence number that indicates a particular time-offset in a number of time-offsets in a predetermined frame period, m represents a number of said code assignment commands, and r represents a sequence number that indicates in a sequence of said code assignment commands a position of a code assignment command in said sequence which contains a preamble code number i transmitted by said mobile station in said particular time-offset.

7. The system of claim 1, wherein a first one of said second stations performs a random access attempt by transmitting a first one of said one or more request packets including a preamble code p_i and a padding code encoded by a scrambling code S_i and if said first station correctly receives said preamble code P_i and said padding code without error, said first station sends a code assignment command indicating that said random access attempt of said first one of said second stations is successful.

8. The system of claim 7, wherein said first one of said second stations transmits said preamble code p_i in a j^{th} time offset of a frame and detects among said one or more code assignment commands, a code assignment command containing said preamble code p_i, said first one of said second stations transmits its one of said data packets to said first station while employing a data scrambling code s_k, where s_k is selected via the equation:

$$k = j \times m + r$$

where j represents a sequence number that indicates a particular time-offset in a number of time-offsets in a predetermined period of said frame, m represents a number of said code assignment commands, and r represents a sequence number that indicates in the CAC sequence the position of the CAC which contains the preamble code P_i.

9. The system of claim 1, wherein if said first station determines that there are greater than m of said request packets correctly received from said second stations, said first station transmits

said code assignment commands to authorize only m of said second stations to transmit said data packets to said first station.

10. The system of claim 7, wherein selection of said scrambling code s_i is determined by said preamble code p_i in accordance with a one-to-one mapping of function $g: P \rightarrow \Psi$:

$$g(p_i) = s_i, i = 0...15$$

where P represents the set of all preamble codes and Ψ represents the set of all scrambling codes.

11. A multi-channel communication system for data communication comprising:

a first station;

a plurality of second stations; and

medium access control means for controlling operation of said data communication via a plurality of data links, a plurality of forward control links, and a single reverse control link between said first station and said second stations, said operation comprising:

transmitting, from said second stations, one or more request packets to said first station via said plurality of forward control links, each of said one or more request packets including a preamble code and a padding code,

transmitting, from said first station, one or more code assignment commands to one or more of said second stations via said reverse control link, and

transmitting, based on said one or more code assignment commands, one or more data packets from said one or more of said second stations to said first station via said plurality of data links.

12. The system of claim 11, wherein said communication system is a wireless system, said first station is a base station and said second stations are mobile stations.

13. The apparatus of claim 11, wherein said padding code comprises a dummy data code and an error detection code for collision detection by said first station.

14. The apparatus of claim 11, wherein said padding code is selected based on a random selection of said preamble code.

15. The system of claim 11, wherein a predetermined number of said preamble codes transmitted by said at least one second station is processed by said first station.

16. The system of claim 11, wherein one of said one or more of said second stations spreads and modulates said data packet by a data scrambling code, and said data scrambling code as represented by s_k is randomly selected as follows:

$$k = j \times m + r$$

where *j* represents a sequence number that indicates a particular time-offset in a number of time-offsets in a predetermined frame period, *m* represents a number of said code assignment commands, and *r* represents a sequence number that indicates in a sequence of said code assignment commands a position of a code assignment command in said sequence which contains a preamble code number i transmitted by said mobile station in said particular time-offset.

17. The system of claim 11, wherein a first one of said second stations performs a random access attempt by transmitting a first one of said one or more request packets including a preamble code p_i and a padding code encoded by a scrambling code S_i and said first station correctly receives said preamble code P_i and said padding code without error, said first station sends a code assignment command indicating that said random access attempt of said first one of said second stations is successful.

18. The system of claim 17, wherein said first one of said second stations transmits said preamble code p_i in a j^{th} time offset of a frame and detects among said one or more code assignment commands, a code assignment command containing said preamble code p_i, said first one of said second stations transmits its one of said data packets to said first station while employing a data scrambling code s_k, where s_k is selected via the equation:

$$k = j \times m + r$$

where *j* represents a sequence number that indicates a particular time-offset in a number of time-offsets in a predetermined period of said frame, *m* represents a number of said code assignment commands, and *r* represents a sequence number that indicates in the CAC sequence the position of the CAC which contains the preamble code P_i.

19. The system of claim 11, wherein if said first station determines that there are greater than *m* of said request packets correctly received from said second stations, said first station transmits said code assignment commands to authorize only *m* of said second stations to transmit said data packets to said first station.

20. The system of claim 17, wherein selection of said scrambling code s_i is determined by said preamble code p_i in accordance with a one-to-one mapping of function $g:P \rightarrow \Psi$:

$$g(p_i) = s_i, i = 0..15$$

where *P* represents the set of all preamble codes and Ψ represents the set of all scrambling codes.

21. A multi-channel communication system for data communication comprising:

a first station;

a plurality of second stations; and

medium access control means for controlling operation of said data communication via a plurality of data links, a plurality of reverse control links, and a forward control link between said first station and said second stations, said operation comprising:

transmitting, from said second stations, one or more request packets to said first station via said plurality of reverse control links, each of said one or more request packets including a preamble code and a padding code which is encoded by a random access scrambling code,

transmitting, from said first station, one or more code assignment commands encoded by a channelization code to one or more of said second stations via said forward control link, and

transmitting, based on said one or more code assignment commands, one or more data packets encoded by data scrambling codes from said one or more of said second stations to said first station via said plurality of data links.

22. The system of claim 21, wherein said communication system is a wireless system, said first station is a base station and said second stations are mobile stations.

23. The system of claim 21, wherein said padding code comprises a dummy data code and an error detection code for collision detection by said first station.

24. The system of claim 21, wherein said random access scrambling code is selected based on a random selection of said preamble code.

25. The system of claim 21, wherein a predetermined number of said preamble codes transmitted by said second stations is processed by said first station.

26. The system of claim 21, wherein a code s_k of said data scrambling codes is randomly selected as follows:

$$k = j \times m + r$$

where j represents a sequence number that indicates a particular time-offset in a number of time-offsets in a predetermine frame period, m represents a number of said code assignment commands, and r represents a sequence number that indicates in a sequence of said code assignment commands a position of a code assignment command in said sequence which contains a preamble code number i transmitted by said mobile station in said particular time-offset.

27. The system of claim 21, wherein a first one of said second stations performs a random access attempt by transmitting a first one of said one or more request packets including a preamble code p_i and a padding code encoded by a scrambling code S_i and said first station correctly receives said preamble code P_i and said padding code without error, said first station sends a code assignment command indicating that said random access attempt of said first one of said second stations is successful.

28. The system of claim 27, wherein said first one of said second stations transmits said preamble code p_i in a j^{th} time offset of a frame and detects among said one or more code

assignment commands, a code assignment command containing said preamble code p_i, said first one of said second stations transmits its one of said data packets to said first station while employing a data scrambling code s_k, where s_k is selected via the equation:

$$k = j \times m + r$$

where j represents a sequence number that indicates a particular time-offset in a number of time-offsets in a predetermined period of said frame, m represents a number of said code assignment commands, and r represents a sequence number that indicates in the CAC sequence the position of the CAC which contains the preamble code P_i.

29. The system of claim 21, wherein if said first station determines that there are greater than m of said request packets correctly received from said second stations, said first station transmits said code assignment commands to authorize only m of said second stations to transmit said data packets to said first station.

30. The system of claim 27, wherein selection of said scrambling code s_i is determined by said preamble code in accordance with a one-to-one mapping of function $g: P \rightarrow \Psi$:

$$g(p_i) = s_i, i = 0..15$$

where P represents the set of all preamble codes and Ψ represents the set of all scrambling codes.